

Lifetime Achievement Award for Harry Trueman

On 28 October Harry Trueman, former Chair of the National Committee on Engineering Heritage (now Engineering Heritage Australia) and member of the Sydney Engineering Heritage Committee, was presented with a *Lifetime Achievement Award* in recognition of his professional contribution towards engineering heritage in New South Wales.

Harry's was the inaugural award and was made as part of the 2004 NSW Government Heritage Volunteers Awards conducted by the Heritage Council of NSW. The award was presented at Parliament House by Hon. Diane Beamer, Assistant Planning Minister.

The citation reads;

Harry Trueman has been one of the foremost advocates for the conservation of engineering heritage in the past two decades. He can be truly proud of his legacy, which can be seen in the continuing existence of unique engineered structures such as Pymont Bridge, Hampden Bridge at Wagga Wagga and the Gundagai road and rail viaducts.

Before his retirement in 1998 Harry was the principal partner in the nationally reputed consulting engineering firm of Hughes Trueman and was highly respected as a civil engineer. In the last years of his career he specialised in the conservation of engineering heritage.

In addition to his extraordinary influential professional career, he has also served for more than two decades in a voluntary capacity, applying his extensive knowledge and skills as an activist, an advocate, in awareness raising, in educating colleagues and in serving on advisory groups and committees.

This award is in the form of a Lifetime Achievement Award and recognises his outstanding contribution to the field of engineering heritage in both a professional and volunteer capacity.

All his colleagues extend their sincere congratulations to Harry, and their thanks for his immense contribution to the conservation of engineering heritage.

Michael Clarke



Harry Trueman is presented with his award by NSW Assistant Planning Minister, the Hon. Dianne Beamer

First Trains - Then and Now Crossing the Fergusson River

On 26 March 1918 the first train crossed the newly completed Fergusson River bridge 267 km south of Darwin heading south on the 3 6 gauge North Australia Railway (NAR). At that time the NAR was being extended from Pine Creek to the north bank of the Katherine River at Emungalan. The original Palmerston and Pine Creek Railway from what we now know as Darwin to Pine Creek was completed in 1889. In 1927 the line was extended across the Katherine River to the town of Katherine on the south bank and a further 187 km south to Birdum where construction stopped in 1929.

The 1918 photograph taken as the first official train crossed the Fergusson River Bridge shows a leisurely celebration of the event with the train stopped on the bridge and men standing in front of the locomotive.

The bridge consists of five spans, three of 100 feet and two of 60 feet on concrete piers with concrete abutments. The bridge is a riveted steel plate girder



First train on the North Australia Railway crossing the Fergusson River Bridge in March 1918. (Photo courtesy of Commonwealth Railways (now Australian National) and the Australian Railway Historical Society)



First train on the Alice Springs to Darwin Railway crossing the Fergusson River Bridge in January 2004

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Engineering Landmarks and the National Heritage List

Engineering Heritage Australia has been recognising significant engineering works through its plaquing program since 1984, during which time over 100 plaques have been issued to recognise the engineers concerned and their design and construction. Those with national significance are awarded a National Engineering Landmark or NEL for short. The first of these was unveiled in 1986 on Lennox's Landsdowne Bridge in New South Wales, and this was followed in 1987 by the Coolgardie Goldfields Water Supply Scheme in Western Australia. Since that time NELs have been placed on engineering works that are household names, like Sydney Harbour Bridge and the Snowy Mountains Hydro-Electric Scheme, whilst others recognise lesser known but none-the-less important works like Cethana Dam in Tasmania or the CSIRAC Computer in Victoria.

Many of the 30 works recognised with NELs, and the more than 70 works recognised with Historic Engineering Markers, are also listed on the Commonwealth's Register of the National Estate (RNE) and on the relevant State registers.

The RNE commenced operation after the Commonwealth enacted heritage legislation in 1975. Since that time all States and Territories have introduced legislation and registers to protect places within their jurisdiction. The Commonwealth also became involved in nominating World Heritage Sites in Australia, and last year passed legislation which created a new register known as the National Heritage List for Australian places of outstanding significance. The RNE will continue as a database of significant places across Australia, but the National list will have a higher threshold for entry and will provide a high level of protection for the places contained through the provisions of the Environmental Protection and Biodiversity Conservation Act. A new list of Commonwealth places is also being created with stronger controls than the RNE.

Engineering Heritage Australia is considering how to best nominate engineering places that it has identified as having national significance. We have had very useful discussions with staff from the Heritage Branch of the Department of Environment and Heritage, and have exercised our minds in recent times regarding the meaning of heritage significance. One issue is the difference between nationally significant engineering and places associated with engineering achievement that have high social significance for the people of Australia, without necessarily being outstanding engineering. We believe many of our NELs fit into both categories and we will be nominating some of them to the Commonwealth for the National List over the coming months.

In opening the redeveloped Engineering House, national headquarters of Engineers Australia in Canberra, on 13 October, the Governor General, His Excellency Major General Michael Jeffrey, reflected on some of Australia's great engineering achievements. He mentioned a number of the landmark places that have been discussed above, but also emphasised Busby's Bore in Sydney, highlighting Australia's first engineered water supply in our dry continent where water is becoming increasingly important. Busby's Bore received a NEL from Engineering Heritage Australia in 1988, coincidentally the same year as Sydney Harbour Bridge. While it is not as well known nationally and internationally as the bridge, maybe Busby's Bore should be given more consideration.

Keith Baker

First Trains - Then and Now Continued from page 1

structure with the rails laid on the girders (deck-type). Far-sighted engineers early in the twentieth century built the bridge to carry a standard gauge line so the Fergusson River Bridge became the only major bridge from the old NAR to be re-used in the new Alice Springs to Darwin Railway eighty-six years later.

At 9.05 am on 17 January 2004 the first train on the newly completed standard gauge railway from Alice Springs to Darwin crossed the same bridge over the Fergusson River on its way to Darwin.

This time there was no time to stop on the bridge for a picture and to let the train crew stretch their legs. The two kilometre long FreightLink mixed train (mostly freight but with some passenger cars to carry dignitaries), hauled by three diesel-electric locomotives crossed the old bridge at about 100 kilometres per hour and pressed on to Darwin to complete its historic first south-to-north crossing of the continent.

Apart from the construction of a new upper structure on the bridge to carry the steel sleepers of the standard gauge line and the addition of walkways and railings on either side of the track, the 86 year old bridge is unchanged. Another difference is the presence of the Stuart Highway road bridge just downstream from the old rail bridge. The piers of this bridge can be seen in the 2004 photograph beneath the railway bridge. The Stuart Highway, originally called the Coach Road, wasn't much more than a goat track in 1918 when the railway bridge was built, and the present-day National Highway is a far cry from the original sealed road built during World War Two.

The two "first trains" were heading in opposite directions. The 1918 train from Darwin to Emungalan and the 2004 train from Adelaide to Darwin. The abutment seen in the background of the 1918 photograph is in the foreground of the 2004 photograph.

From an Engineering Heritage viewpoint the re-use of the Fergusson River Bridge is a great success. Now forming part of a major nation-straddling rail link, the bridge will be maintained to present-day standards by FreightLink. The fact that so little modification was necessary reinforces this success. The Fergusson River Bridge is one piece of Engineering Heritage over which heritage-sensitive engineers can rest easy.

Owen Peake

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Engineers Australia's Oral History Collection Swells to 193

The Engineers Australia Oral History Collection at the State Library of New South Wales has been increased to 193 interviews with the deposit of the 220 tapes of a further 82 Sydney Division interviews.

The presentation was made on 4 November by Richard Phillips, Director Sydney Division, to Ms Elizabeth Ellis, Assistant State Librarian, Collection Management Services & Mitchell Librarian, representing the State Librarian. The guests included Barry Anderson, President of the BMC-Leyland Heritage Group, Michael Clarke, Manager of the Oral History Program and Ms Sarah Szacsvey, Oral History Coordinator.

In welcoming the guests to the ceremony, Ms Ellis said:

(The Oral History Program) was a brilliant concept and, as to be expected from members of the engineering profession, was carried out with impeccable precision and accuracy. The second presentation of 156 tapes ... came to the Library in perfect order and ready for immediate incorporation into the collection, fully logged and summarised as is the latest donation we are celebrating today. I might say that it is not always so, with donations of original materials to the Library sometimes leaving a lot to be desired ... leaving staff with the at times superhuman job of bringing order to chaos after their acceptance. It takes great discipline and dedication to persevere from the first idea of compiling a collection through to final achievement ...

It is salutary that Engineers Australia is so committed to their own history in a manner which is eminently practical and enduring and which links so well with other resources which document the history of

the lives and people in this state held in the State Library. Of all the oral history projects of professions held here, this program is the most comprehensive, the most active and the most carefully presented.

In the process of engaging appropriate oral history interviewers for the project, the Heritage Committee has perfected the relevant tender and commissioning documents and they have very generously shared their high standards with other colleagues in the Oral History Association representing cultural institutions from across the nation ...

Engineering Australia's oral history project has become one of the landmark enterprises in the Library's oral history collection – and we are very grateful and proud to be the recipients of the results of this great undertaking. Thank you for

entrusting this work to us for preservation for posterity and for access and use by researchers in the Mitchell Library now and in the future.

The interviews included 14 conducted by the Monaro Group of Engineers Australia of retired Snowy engineers, and the 17 done by the BMC-Leyland Heritage Group for its project about the history of BMC-Leyland in Sydney.

The BMC-Leyland project was a very significant one as the company along with the Snowy Scheme played a major role in the employment and assimilation of post-war European migrants; the tapes will thus be an important social history resource.

The Engineers Australia Oral History Collection at the State Library is becoming the recognised place to research engineers through oral history.

Michael Clarke



Barry Anderson, Richard Phillips, Elizabeth Ellis, Sarah Szacsvey and Michael Clarke at the State Library presentation

Identification and Assessment of Engineering and Industrial Heritage

As part of its continuing liaison with the NSW Heritage Office, Sydney Engineering Heritage Committee has developed an illustrated brochure to assist heritage professionals who lack an engineering background with the identification and assessment of items of engineering and industrial heritage.

The brochure

- canvasses the values of engineering heritage
- points out that engineering items are often hidden, or can be overlooked because they are commonplace
- makes the point that it can be difficult to assess the significance of items belonging to a technology that is changing rapidly and, further, that the rapidity of change means a time factor cannot be applied when deciding whether an item has achieved heritage status
- states that engineering and industrial items should be evaluated by someone knowledgeable in the relevant technology and its history
- identifies a number of issues that relate to the identification, assessment and conservation of engineering and industrial heritage.

The issues include the shortage of materials (e.g., large dimension timber), the declining skills base (e.g., riveting), lack of



funds, particularly when the item no longer has a useful purpose or ceases to produce income, and constraints of modern safety laws and environmental regulations.

The brochure also gives some examples of engineering and industrial heritage, provides a list of useful resources and publications and suggests where help may be obtained when assessing engineering heritage. Photos of two such examples

It is expected that the brochure will soon be made available on the Heritage Office's website at www.heritage.nsw.gov.au.

Michael Clarke



Lewisham sewer vent, 1909 and a rail tip wagon from the construction of Burrinjuck Dam. Two typical items identified in the study

Awarding Merit

As previously reported in this Newsletter, Engineering Heritage Australia has established an Award of Merit for Engineering Heritage to recognise and show appreciation to members of Engineering Heritage Australia committees and groups and their supporters and collaborators. The award will recognise significant voluntary service, often over many years, to the cause of engineering heritage. The award consists of a certificate together with a citation mounted in a single frame.

The second award made under this program was to Henry McFie.

In 1978 Henry McFie formed the Tasmania Division Engineering Heritage Committee and became the inaugural Chairman. He held this position until 1985 but remained actively involved until 2000. During his 22 years on the committee, Henry was extremely active in gathering a considerable amount of data on engineering heritage works and biographies of engineers.

A notable achievement was the restoration of the Royal Engineers Building in Hobart which was built by the Royal Engineers Regiment in 1846 as their headquarters. When the Imperial Forces were withdrawn from Tasmania in 1870, the building was passed to the Tasmanian Government Railways. It gradually fell into disrepair and was almost derelict in 1980 when demolition was proposed. Henry believed that it was a vital part of Tasmania's engineering past, and mounted a successful appeal for the restoration of the building. Fittingly the building is now the Tasmanian headquarters of Engineers Australia, the Association of Consulting Engineers Australia and the Association of Professional Engineers Scientists and Managers Australia, and a local landmark.

Henry served on the National Committee on Engineering Heritage (now Engineering Heritage Australia) from 1979 until 1987 and was chairman in 1985/6. He attended all National Conferences until 1996 and presented three papers. He also served on the Tasmanian Heritage Council for two years from its formation in 1997.

Enquiries about the Award of Merit for Engineering Heritage can be made to Benita Honig, Administrator of Engineering Heritage Australia at (02) 6270 6525 or bhonig@engineersaustralia.org.au.



Engineering House

Seals and Logos on Engineering House, Canberra

When next you visit Engineering House, the home of Engineers Australia in Canberra, you will find both wings of the building facing National Circuit adorned with the Institution's logo as well as the pre-existing seals.

When national office moved from Sydney to Canberra in 1969, the two large bronze seals (see photo), commonly described as "Australia in Chains", were placed on the façade of the new two-storey building. This circular design appears on membership certificates and awards, and is used on official documents.

Symbolically the chain surrounding Australia represents the unity of all the engineering disciplines in one institution. The words on the seal effectively brand the building and associate it with the creation of the Institution in 1919.

The seal also served as the Institution logo until 1987 when a separate logo ("the red nut") was adopted. Badges and ties featuring the seal were superseded and are now heritage items.

In November 2002 Council adopted "Engineers Australia" as its common name, and the logo was enhanced in March 2003 by the addition of highlights on both portions of the hexagon.

In this design, the hexagon is the benzene ring of chemical engineering, the bolt head of mechanical, the radio cell of electronics and telecommunications, and is part of a honeycomb representing the strength of structural and aerospace engineering. The hexagon is divided by an arc or arch representing our heritage in civil engineering, as well as the sine wave of electrical and the trajectory of military engineering.

On completion of the recent building program, Engineering House has become a four-storey building of which the Institution owns the lower two floors. Council was keen to display its new brand name and enhanced logo on the building. The initial proposal was to remove the seals and replace them with the new signage, and Engineering Heritage Australia (EHA) was asked to suggest new homes for the seals.

EHA decided to strongly oppose the removal of the bronze seals, as their removal would amount to a breach of the Burra Charter on Engineers Australia's own doorstep. EHA argued that the seals are icons of our history, and their heritage significance is strongly related to the building. While Engineers Australia's need to project a modern image to its members and the public was accepted, EHA considered that this desire did not justify the Institution cutting connections with its illustrious past.

In May 2004 Council approved an alternative plan in which the seals would remain in place and the logos with "Engineers Australia" beneath them would be added on both wings (see photo). This win-win outcome is considered to be highly satisfactory, as the bright red hexagons brand the building, catch the eye and attract attention to the original seals.

Unfortunately the enlargement of the building did not go smoothly, as the developer went into receivership following practical completion. The fit-out contract was subsequently undertaken by national office staff under the progressive approvals of Council. Deputy CEO Garry Bates won Council approval for the signage proposal, and the Body Corporate Manager for Engineering House, Ross Laing, deserves special mention for completing the fit-out with a small band of supporting contractors.

The enlarged building with its new signage was officially opened by the Governor-General, Major General Michael Jeffrey, on 13 October 2004.

EHA is not Alone!

The Institution of Civil Engineers (United Kingdom) has a Panel for Historical Engineering Works (PHEW) which has similar goals to Engineering Heritage Australia (EHA). PHEW publishes a regular Newsletter which can be accessed through the ICE website, <http://www.ice.org.uk>.

A short review of a few of the highlights of the PHEW Newsletter Number 102 of June 2004 might be of interest to put EHA activities in context with what others are doing.

- The lead article reports on the placing of a plaque commemorating the work of Scotland's great civil engineer Robert Stevenson on the Melville Monument in Edinburgh. Stevenson had used technology and experience he developed in building the Bell Rock Lighthouse to direct the erection of the 43m high, 1500 tonne column of the Melville monument in 1821.
- A plaque unveiling ceremony occurred recently in London to celebrate the anniversary of major setback in the construction of the first tunnel under the River Thames. On 18 May 1827 Marc Brunel suffered his first major setback

Owen Peake

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Bruce Cole

Engineering Heritage to the People



Michael Clarke leads a group on a Sydney walk. (This photo appears ripe for a humorous caption if readers feel so inclined – Ed.)

Since 1994 when it produced the walking guide *Sydney's Engineering Heritage*, the Sydney Engineering Heritage Committee has conducted 156 heritage walks and tours with 2380 participants.

The activities are held during Seniors' and Engineering Weeks and the Heritage Festival, for Young Engineers Sydney and on request for community groups like Probus Clubs. The participants learn a lot about Sydney's history and heritage and have shown their appreciation

with comments such as 'I've been walking around this city for 40 years and I've seen and heard about things today that I didn't know existed'.

The four walks are: *Sydney's Birthplace* – around Sydney Cove, The Rocks and Observatory Hill; the *Whitton Walk* – around Central railway station, the Mortuary Station, Darling Harbour and Pyrmont Bridge; *Macquarie Street and Sandstone Sydney*, which includes the Lands Department building, Macquarie Place and the former GPO; and *Sydney Harbour Bridge*, when the bridge and its construction are described.

Recently two four hour cruises have been added to the program. *The Harbour that Worked* explores industrial, manufacturing and shipbuilding sites, as well as those of powerstations, gasworks and other facilities west of the Sydney Harbour Bridge, with a BYO picnic in the park adjacent Woolwich Dock. *The History and Heritage of East Port Jackson* follows the southern shore (with a picnic on Shark Island) to Watsons Bay and then crosses to Georges Head before returning down the northern shore, visiting Mosman and Neutral Bays. A commentary is provided together with comprehensive illustrated handout notes and a map.

The cruises have been booked out so quickly that additional ones have had to be provided.

Michael Clarke

EHA is not Alone! - Continued from page 4

when the river suddenly burst into the tunnel at Rotherhithe. Digging was suspended for several months while repairs were carried out. On 10 November Isambard Kingdom Brunel, now Resident Engineer of the tunnel, organised a banquet in the tunnel to celebrate the resumption of work. The tunnel was finally completed and is still in use.

- A report on a visit to the Comet Flight Test Hangar at Hatfield tells of a remarkable, but quite recent example of engineering heritage. The building is one of the largest all-aluminium structures in the world with a plan of 61m by 100m and a clear height of 14m. It was built in 1952-54 to accommodate up to seven de Havilland Comet 1 aircraft – the world's first jet airliner. The building is currently being redeveloped by its present owner, the University of Hertfordshire, as a sporting complex which will include an indoor swimming pool and tennis courts.
- A letter from A G Banks brings to the attention of PHEW to modern modifications to the famous Saltash Royal Albert [railway] Bridge by I K Brunel completed in 1859. Some years ago crude access ladders and platforms were added to the east and west portals of the bridge, presumably to meet increased health and safety rules. Not only is this steelwork unsightly but it partially obscures the dedications to the famous engineer. The letter exhorts the PHEW to support a campaign to remove the offending structures and restore the bridge to its former glory.

All these activities have parallels to the work which EHA is undertaking. It is helpful to observe what others are doing in the same field of endeavour.

Owen Peake

The John Monash Medal

The John Monash Medal for Engineering Heritage has now been awarded twice: in 2003 to Professor Colin O'Connor FIEAust and in 2004 to Mr John (Jack) Ross AM FIEAust. Through some publishing troubles which resulted in Issue 15 of the Newsletter being reissued as Issue 15A, Professor O'Connor's award was omitted from the last issue so we now report on both awards, each being presented at the respective Engineers Australia AGM.

In the citation for the 2003 award it was noted that Emeritus Professor Colin O'Connor has made an outstanding contribution to the raising of awareness of Australia's engineering heritage both within the profession and within the wider community.

In 1979 he was commissioned by the Australian Heritage Commission and the Institution of Engineers Australia to undertake what is recognized as the definitive survey of Australia's historic bridges. This study not only resulted in the required report but led Colin to make the work available to a wider audience in the "How to Look at Bridges" booklet and, later, the book "Spanning Two Centuries: Historic Bridges of Australia".

Colin has continued to contribute significantly to the conservation of heritage bridge structures, through his investigations into the maintenance and conservation of structures and his publications. His book "Roman Bridges" was published in 1993 by Cambridge University Press and he is currently working on a related work on "The History and Development of Stone Bridges".

For the 2004 award, the citation read, in part, John Francis Ross, AM has made an outstanding contribution to the collection of artefacts and the recording of the history of broadcast engineering from the early days in the 1920's through to the present era.

"Jack" as he is widely known, began his career in the Brisbane Office of the Post Master General's Department in 1938. He retired 50 years later as the State Broadcasting Manager for South Australia. During his career, he participated in tremendous national and international advances in broadcast engineering.

Recognising that much of the material with which he has worked will be unintelligible to future generations of engineers, he set about preserving this unique but volatile history. Most significantly for heritage engineering, he has authored seven well researched books on the subject.

Jack Ross has provided a sound foundation for the retention of the engineering heritage of his chosen profession.



Presentation of 2003 medal to Colin O'Connor by then National President Dr Peter Greenwood



Jack Ross with his wife Patricia at the 2004 AGM and medal presentation

The EHA Committee

Keith Baker, from Canberra Division, has taken the chair of EHA at the beginning of 2005 for a two year term; Robin Black from Queensland Division assumed the deputy chair position.

Peter Cockbain, Newcastle Division representative for some years has been replaced by Malcolm Clark following Peter's election as Engineers Australia's National Deputy President and President-elect for 2006. We congratulate Peter on his election and feel proud that one of our number should be elevated to EA's highest office.

A Peake at Steam

Further tales of heroic steam from EHA member Owen Peake

Broken Hill Water Supply - Umberumberka Reservoir and Pumping Station



Umberumberka Dam

Like many towns in the Outback Broken Hill has had a struggle with water supply. When mining started in 1883, small dams, waterholes and wells were used as a water source but these soon became inadequate. In 1892 the Broken Hill Water Supply Company Limited was formed and built a dam on Stephens Creek 15km north-east of Broken Hill. This reservoir is still in service today.

By 1901 the supply from Stephens Creek was insufficient and there was a proposal to build a dam on Umberumberka Creek 33km north-west of Broken Hill. There were delays and construction did not commence until 1903 then the partly completed dam was swept away by floodwaters and the site was abandoned. By 1907 further plans were drawn up for a different site on Umberumberka Creek. Again there were delays and work did not commence until 1911.

By 1915 the 26 metre high concrete gravity dam was completed. It was 207 metres long at the crest with a storage capacity of 13.2 megalitres which had reduced to 7.8 megalitres by 1974 due to siltation. The project included a steam pumping station below the dam, a pipeline to Broken Hill and a steel service reservoir on Blue Anchor Hill near the centre of Broken Hill.

The original pumping engine was supplied by the German coal company Wolff and was not satisfactory. This engine was replaced by a single Hathorn Davey of Leeds inverted vertical triple expansion steam pumping engine in 1921. A second similar machine was added in 1926. This plant remained in service until 1960 when it was replaced by diesel engine driven centrifugal pumps due to the high cost of coal. The steam plant has been preserved.

The Stephens Creek and Umberumberka reservoirs continued to supply the town until 1952 when further augmentation was required. A pipeline was built from the Menindee Lakes on the Darling River 104km south-east of Broken Hill to the Stephens Creek Reservoir from where water is delivered to the town. Stephens Creek (with the injection of water from Menindee Lakes) and Umberumberka Reservoirs continue to supply Broken Hill with water.

Charters Towers Water Supply

Rare steam pumping engines survive into the 21st century

Charters Towers, 135 km south west of Townsville wasn't always a quiet country town best known for its boarding schools. Gold was discovered in 1871 and a municipality was declared in 1877. The city soon grew to 30,000 people with its own stock exchange and school of mines. Fine buildings were erected, many of which survive today and Charters Towers became the second largest city in Queensland.

Although the gold had gone by the 1920's the city remained an important regional centre. It services a huge pastoral hinterland, became a centre for education institutions serving the people of the Outback and experienced another boom during the Second World War when five military bases and 15,000 defence personnel from the United States and Australia were based there.

Through all this period two steam pumping engines on the banks of the Burdekin River supplied water to the city.

A plan for a permanent and reliable water supply came to fruition in 1887 when the Charters Towers Water Board was gazetted. An order was placed on Hathorn Davey & Co. of Leeds, England for a "75 hp compound engine with a capacity of 20,000 gallons per hour". The waterworks on the south bank of the Burdekin River were completed and the pumping engine was commissioned in 1890. A second similar engine was ordered in 1890 and was in service by late 1892.

The engines are unusual, being of the vertical inverted cross-compound non-rotative type using the 'Davey Differential' system of control. The engines were located high on the bank of the flood-prone river over a large brick well which communicated below water level with the river via an inlet tunnel. The pumps were located at the bottom of this well immediately in line with the piston rods. A system of beams mounted below the engines provided parallel motion to the pump rods and maintained the phase relationship of the two cylinders of each engine.

The 'Davey Differential' system, patented by Henry Davey in 1871, was one of the most successful attempts to control non-rotative steam engines. The Charters Towers engines are now one of only two pairs of complete engines surviving fitted with the 'Davey Differential' system. The other pair are horizontal compounds at the Cheddars Lane Sewerage Pumping Station in Cambridge, England.

The three cylindrical Cornish boilers were wood-fired. Wood was collected from the northern side of the river and transported to the riverbank by a tramway system and across the river by a flying fox.

The engines operated continuously until 1942 when the first electric pumps were installed. After the war the steam pumps were used occasionally until at least 1954. The Boiler

House, boilers and the Pump House building were later removed but the steam engines remain virtually complete after 64 years of faithful service and 50 years of retirement.



The Davey differential engines remain as a landmark at Charters Towers

Ride the Unique Purrey Steam Tram

The world's only Purrey steam tram lives in Rockhampton, Queensland and operates every Sunday! In August, a party from Engineering Heritage Australia (Qld) enjoyed the ride. Ray Boyle, EHA(Q)'s corresponding member in Rockhampton said of the tram ride, "It is a wonderful experience. It's even more remarkable when you know it comes from a fleet which was scrapped in 1939!"

The tram is a restoration using parts recovered from the nine operated by Rockhampton City Council and the two operated by Queensland Government Railways. The QGR "tram trains", could be described as steam rail-motors or light rail. The search for parts began in 1976 in a Rockhampton park and then followed lists of farmers who had bought trams and trailers. A chassis was found on a siding at Port Alma, and EHA(Q) committee member Geoff Smethurst and the Antique Machinery Restoration Society recovered an ex QGR engine at Hancock's ply mill in Ipswich. Metal parts were reconditioned or replicated and the joinery was built using photographs and Queensland Government Railway engineering drawings. The restoration became a Bicentennial project with an army of professionals and amateurs involved. The restoration was completed when the tram again carried paying passengers (museum visitors) on the 5th June 1988.

Some Australian regional cities worried about the capital cost of electric trams and chose steam trams instead. Rockhampton chose the smokeless, elegant trams built by Valentin Purrey of Bordeaux, France, to avoid the "objectionable, noisy, dirty and



Purrey tram with EHA (Q) tourists

dangerous steam trams which ran in Sydney." The Purrey design, which was also used for steam lorries, has a coke fed water tube boiler, operating at 1650 kPa, behind the driver. The steam is fed to a two cylinder simple engine below the floor, which drives sprocket wheels. A chain took power to the front wheels. "Toast-rack" seating was placed between the boiler and the conductor at the rear and water is stored in tanks under the

seats. Up to two toast-rack trailers could be towed at busy times. The Rockhampton system involved 10.34 km of 1067 mm (3 6) gauge grooved rail in generally unsealed roads. There were balloon loops at each terminus so the driver was always in front. The steam trams eventually lost out to buses which did not have to pay for their permanent way.

The Purrey steam tram lives in Rockhampton's Archer Park Station & Steam Tram Museum, and runs down the middle of Denison Street on abandoned Queensland Rail track for about 4 city blocks. The station dates from 1899 and served as the City's main station until trains became too long. Bill Oliver, sometime chairman of the Queensland Division Heritage Panel summed it up: "The museum has a good collection, presented in the modern manner. It's uncluttered, well interpreted, and has an overall steam station soundscape. As you approach some of the white plaster people you find yourself eavesdropping on them doing hundred-year-old things".

Further information

Australian Railway Historical Society Bulletin (1974) Nos. 440, 442, and 443

Nicholson, J (1988) Rocky's "Puffing Billies", self published
Website: www.steamtram.rockhampton.qld.gov.au

Robin Black

Heritage Festival Plaquing - Swan Hill Bridge

In recent years the Roads and Traffic Authority NSW has participated in the National Trust's annual Heritage Festival by a program of activities centred on a particular theme and a district of NSW.

Two principal activities of each program have been the plaquing of major items of historic engineering roadworks by Engineers Australia and the launching of an RTA tourist guide brochure highlighting some of the district's historic and heritage features.

In 2002 the 1832 Victoria Pass was plaqued as a National Engineering Landmark, the 1893 McKanes Bridge (a McDonald timber truss) was awarded an Historic Engineering Marker, and the brochure "Crossing the Blue Mountains" was launched.

In 2003 the Southern Highlands were the focus of the RTA brochure and the plaqued work was Percy Allan's magnificent timber truss Victoria Bridge over Stonequarry Creek at Picton.

For 2004 the RTA chose to highlight the border crossings between New South Wales and Victoria with a brochure "Bridging the Murray" and Engineers Australia through its Sydney Engineering Heritage Committee, nominated the 1896 lift bridge at Swan Hill (another Percy Allan structure) for plaquing as an Historic Engineering Marker.

Support for the event was overwhelming. Led by Mayor David Quayle of Swan Hill Rural City Council and his staff and

with a wide range of community involvement, a program of celebratory events was enacted on Saturday 1 May 2004. It started with a well attended mid-morning plaquing ceremony in Riverside Park on the town side of the bridge.

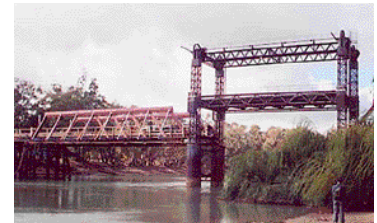
An informative Ceremony Brochure about the bridge and its designer Percy Allan, prepared by Don Fraser, was distributed as attendees arrived.

Media coverage before, during and after was extensive and large coloured posters were displayed throughout the commercial/retail centre of Swan Hill. It was excellent exposure for engineering heritage.

Engineers Australia was represented by Keith Baker of EHA (Canberra), then Deputy Chairman of Engineering Heritage Australia. Representing the National Trust (NSW) was their President the Hon. Justice Barry O'Keefe who launched the RTA's "Bridging the Murray" self-guide brochure.

Overall it was a grand occasion generating an enhanced appreciation of engineering history and heritage among the Swan Hill community, through the selection of their 1896 bridge as an Historic Engineering Marker.

Keith Baker



Swan Hill Bridge has been conserved with retention of its ability to be opened

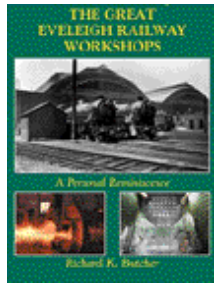
Book Review

The Great Eveleigh Railway Workshops

A Personal Reminiscence

By Richard K. Butler

Ligare – ISBN 0-646-43400-4



Very little to date has been published on this topical industrial heritage subject, but now Richard Butler has produced a very detailed and personal view of how this industrial icon of the NSW railways operated during the last fifty years prior to its closure in 1988.

Richard relates his personal experiences and gives the reader a detailed description of every aspect of how the workshops operated in each functional section on the Redfern site. The heavy industrial trades that produced and overhauled the locomotives, carriages and other wares for the railways are described in depth, complete with excellent hand drawn sketches of each of the trade practices and methods used to produce the various articles. Many of these skills are now in decline and the book is an excellent historical record of how trade skills such as fire welding, boiler-making, tinning and carriage building were practised at Eveleigh.

The book outlines each of the work areas on both the locomotive and carriage works sites and describes specifically the locos and goods produced in each of these areas. The manufacture of individual items is described in detail as well as the author's personal experiences in making them and being part of the overall operation at Eveleigh. He also introduces a number of other Eveleigh employees who briefly describe their personal histories and roles at Eveleigh.

Richard Butler brings his personal views of industrial heritage and conservation into the introduction and reiterates what many old rail workers would think of the loss of the workshops in what was one of the greatest industries and businesses in NSW.

The 240 glossy page hardcover book is extremely well illustrated by the author and carries a great number of both historical and personal photos of past scenes through the workshops and shortly after the workshops closure.

The book can be purchased either at www.eveleighrailwayworkshops.com or through the ARHS Bookshop at Redfern for \$75 plus postage and handling. It is an excellent gift for those interested in the Eveleigh workshops, NSW railways and industrial heritage.

Glenn Rigden

Correction

In an editorial comment in EHA Newsletter No. 15, it was stated that "The NSW government has removed the Land Tax concessions for owners of listed properties". This should have read "...has removed extra concessions for owners of multiple listed properties" and I apologize for the error. The editor has been informed further that a "heritage restricted valuation" now applies to all properties listed at both the State and local level in NSW which will advantage heritage property owners now that all commercial and rental property is subject to Land Tax from January 2005.

Sustaining Heritage

Second International Engineering Heritage Conference
Sydney, 21 to 23 September 2005

The 2005 engineering heritage conference will explore the tools and mechanisms needed to more effectively conserve our heritage - hence the theme *Sustaining Heritage*.

Whilst the focus will be on engineering heritage, the tools are applicable to all areas of heritage endeavour. Consequently we plan to

learn from not only engineers, but others in the heritage business, and to attract a variety of practitioners so we can exchange ideas and develop networks.

Speakers are being invited who have a successful track record of achievement and who will recount how they did it, the problems they've overcome and the issues to be faced in the future.

Sessions and papers will be about issues such as: conserving both heritage and the environment (often in conflict); the problems of conserving timber structures; the difficulties of keeping the knowledge and maintaining skills; conserving moveable heritage; the challenge of sustaining heritage in large organisations; the importance of business planning in ensuring sustainable operations; dealing with non-adaptable structures; experiences in the adaptive re-use of redundant defence sites; interpreting heritage; public awareness; the universal problem of maintaining viable and enthusiastic volunteer organisations; and burning issues and future directions in policy and heritage conservation. For the latter it is planned to tap into overseas as well as local experience.

The week following will be the sesquicentenary of the birth of NSW railways and so on the second day there will be a parallel strand celebrating their history and heritage.

A pre-conference tour will explore the heritage and history of the Illawarra area and the southern highlands, there will be a local tour of interesting sites in the Sydney metropolitan area and a partners' program will provide opportunities for sightseeing, shopping and socialising.

The Powerhouse Museum with its great technological exhibits including operating steam engines is the conference venue and is handy to both the city and Darling Harbour.

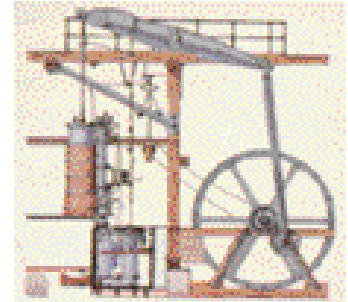
The Conference Dinner will be at the *Watersedge* restaurant on Pier One, Walsh Bay, which has great views of the Harbour Bridge, the north shore and of course, the harbour.

This promises to be an interesting and valuable conference – we look forward to sharing with you, *Sydney in Spring!*

For further information Contact:

Engineers Australia, PO Box 138, Milsons Point 1565 or phone (02) 8923 7100

www.sydney.ieaust.org.au/heritage/heritage_Syd_Conf.htm



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